INSTRUCTIONS FOR TABLE 0

SITE RISK ASSESSMENT IDENTIFICATION INFORMATION

PURPOSE OF THE TABLE: • To uniquely identify the risk assessment • To identify the relevant contacts for the risk assessment.	
INFORMATION DOCUMENTED: • Site information • Contact information . • Risk assessment document information.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table for each risk assessment or Set of Planning Tables. • Number it Table 0. .	
HOW TO COMPLETE/INTERPRET THE TABLE	
Row 1 - Site Name/OU	
Definition: • The name of the site or operable unit (OU) to which this risk assessment applies.	
Instructions: • Enter the name of the site or operable unit.	
Row 2 - Region	
Definition: • The EPA Region in which the site is located.	
Instructions: • Enter the EPA Region in which the site is located.	
Row 3 - EPA ID Number	
Definition: • The EPA number assigned to identify the site.	

Instructions: • Enter the EPA ID Number. The ID can be found either in the site files or in the CERCLIS database.	

INSTRUCTIONS FOR TABLE 0

SITE RISK ASSESSMENT IDENTIFICATION INFORMATION (continued)

Row 4 - State	
Definition: • The state in which the site is located.	
Instructions: • Enter the state or commonwealth in which the site is located.	
Row 5 - Status	
Definition: • The current status of the site.	
Instructions: • Enter the site status.	
Row 6 - Federal Facility (Y/N):	
Definition: • A flag indicating whether or not the site is a Federal Facility.	
Instructions: • Enter 'Y' if the site is a Federal Facility; enter 'N' otherwise.	Y N
Row 7 - EPA Project Manager	
Definition: • The EPA manager responsible for all activity concerning the site.	
Instructions: • Enter the EPA manager responsible for the site.	
Row 8 - EPA Risk Assessor	
Definition: • The risk assessor at EPA responsible for this risk assessment.	
Instructions: • Enter the name of the EPA risk assessor responsible for this risk assessment.	
Row 9 - Prepared by (Organization):	
Definition: • The name of the organization that prepared this risk assessment.	
Instructions: • Enter the name of the organization that prepared this risk assessment.	

INSTRUCTIONS FOR TABLE 0

SITE RISK ASSESSMENT IDENTIFICATION INFORMATION (continued)

Row 10 - Prepared for (Organization):	
Definition: • The name of the organization for whom this risk assessment was prepared.	
Instructions: • Enter the name of the organization for whom this risk assessment was prepared	
Row 11 - Document Title	
Definition: • The title of this risk assessment document.	
Instructions: • Enter the title of this risk assessment document.	
Row 12 - Document Date	
Definition: • The date this risk assessment document was completed or approved.	
Instructions: • Record the date the document was completed or approved in the MM/DD/YYYY format.	
Row 13 - Probabilistic Risk Assessment (Y/N):	
Definition: • A flag indicating whether or not a probabilistic risk assessment was done for this risk assessment.	
Instructions: • Enter 'Y' if a probabilistic risk assessment was done; enter 'N' otherwise.	Y N
Row 14 - Comments	
Definition: • Any additional information provided about the risk assessment.	
Instructions: • Enter any additional information about the risk assessment.	

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS

PURPOSE OF THE TABLE: • To assist in project planning • To accompany the site conceptual model • To present possible Receptors, Exposure Routes, and Exposure Pathways • To present the rationale for selection or exclusion of each Exposure Pathway • To communicate risk information to interested parties outside EPA • To establish a framework for the generation of subsequent Planning Tables. All subsequent tables should be built from the information contained in Table 1.	
INFORMATION DOCUMENTED: • Exposure Pathways that were examined and excluded from analysis • Exposure Pathways that will be qualitatively and quantitatively evaluated in the risk assessment.	
TABLE NUMBERING INSTRUCTIONS • Complete one copy of this table for each risk assessment. Consult the EPA risk assessor to determine if the risk assessment applies to an entire site, a single operable unit, or some other division of the site. • Number it Table 1. • The table should show each Exposure Pathway considered.	***In the Planning Tables, an Exposure Pathway is defined as each unique combination of Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, Receptor Age, and Exposure Route.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the Exposure Pathway.	
Instructions: • Choose from the picklist to the right. If two Exposure Pathways are identical, Current/Future can be used to describe a future and a current pathway.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Column 2 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes = the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Column 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. This includes the transfer of contaminants from one Medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	
Instructions: • Choose from the picklist to the right. ***Note: In the case of two media transferring contamination to the same Exposure Medium, two separate Exposure Pathways should be included in Table 1. See Example Scenario No. 5.***	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2 Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Describe the Exposure Point as text in the table. Multiple Exposure Points may be recorded in the same cell/row if all other aspects of their Exposure Pathways (Scenario Timeframe, Medium, Exposure Medium, Receptor Population, Receptor Age, and Exposure Route) are the same. See Example Scenario No. 1.	
Column 5 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (Receptor Population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right. ***Note: If there are multiple Trespassers/Visitors of different ages, the use Receptor Age (see Column 6) to distinguish between the different receptors. For example, use Trespasser/Visitor with Adolescent (or Child) to indicate youthful trespassers, and Trespasser/Visitor with Adult for adult visitors.***	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Gatherer*** ***Other***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 6 - Receptor Age	
Definition: • The description of the exposed individual as defined by the EPA Region or dictated by the site. ***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***	
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
Column 7 - Exposure Route	
Definition: • The way a chemical or radionuclide comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Choose from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined*** **(Inhalation and Ingestion)** ***Dermal*** ***Not Documented*** ***External (Radiation)***
Column 8 - Type of Analysis	
Definition: • The level of evaluation (quantitative or qualitative) to be performed for the Exposure Pathway based on site-specific analysis.	
Instructions: • Choose from the picklist to the right. ***Note: Present pathways that were not further analyzed (Type of Analysis = None) along with the rationale for their exclusion to document that the pathway was considered.***	***Quant*** **(Quantitative)** ***Qual*** **(Qualitative)** ***None***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 9 - Rationale for Selection or Exclusion of Exposure Pathway	
Definition: • The reason the Exposure Pathway was selected or not selected for quantitative or qualitative analysis.	
Instructions: • Document the reason for selecting or excluding an Exposure Pathway for analysis. Provide a narrative rationale for each Exposure Pathway.	***Consult the EPA risk assessor for the rationale codes.***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

PURPOSE OF THE TABLE: • To provide information useful for data evaluation of chemicals and radionuclides detected • To provide adequate information so the user/reviewer gets a sense of the chemicals and radionuclides detected at the site and the potential magnitude of the potential problems at the site • To provide chemical screening data and rationale for selection of COPCs.	
INFORMATION DOCUMENTED: • Statistical information about chemicals and radionuclides detected in each Medium • The detection limits of chemicals and radionuclides analyzed • The screening toxicity values for COPC selection • The chemicals and radionuclides selected or deleted as COPCs.	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 2 for each unique combination of the following three fields that will be quantitatively evaluated in the risk assessment: Scenario Timeframe, Medium, and Exposure Medium. • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 2.1 and ending with 2.n, where "n" represents the total number of combinations of the three key fields.	***It is possible that some Planning Tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation for each Exposure Pathway. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Row 2 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes = the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
BODY OF THE TABLE	
Column 1 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the table.	***Exposure Points should be defined the same way as was done in Planning Table 1.***
Column 2 - CAS Number	
Definition: • The Chemical Abstract Registry Number, a unique standardized number which is assigned to chemicals and radionuclides.	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Provide the CAS Number for each chemical detected in the samples for the Medium. ***Note: If the CAS number is not available, be sure to enter the Chemical Name in Column 3 and consult the EPA risk assessor.***	***Include dashes in the CAS number. CAS numbers can be arranged in the order that the risk assessor prefers.***
Column 3 - Chemical	
Definition: • The name of the compound detected in samples for the Medium.	
Instructions: • Provide the names of the chemicals which were detected in the sample for the Medium.	***Chemicals can be grouped in the order that the risk assessor prefers. Class descriptions (e.g., PAHs, VOCs, inorganics) can be included as a row before a group of chemicals.***
Column 4 - Minimum Concentration (Qualifier)	
Definition: • Minimum Concentration - The lowest detected concentration of the chemical or radionuclide in the medium. • Qualifier - The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the Minimum Concentration value.	
Instructions: • Enter the minimum detected concentration for the medium. If there is a detected minimum, enter that as the Minimum Concentration. If the concentration is not detected, enter 'ND' as the Minimum and Maximum Concentrations and record the detection limits in the Range of Detection Limits column. • Enter the qualifier associated with the minimum concentration for each chemical or radionuclide in parentheses () after the Minimum Concentration value. Multiple qualifiers should be separated by commas. • Provide the definition of each qualifier in the table footnotes.	
Column 5 - Maximum Concentration (Qualifier)	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Definition: • Maximum Concentration - The highest detected concentration of the chemical or radionuclide in the Medium at the current Exposure Point which is above the sample quantitation limit. • Qualifier - The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the Maximum Concentration value.	
Instructions: • Enter the maximum detected concentration for the medium. • Enter the qualifier associated with the Maximum Concentration for each chemical or radionuclide. • Provide the definition of each qualifier in the table footnotes.	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Column 6 - Units	
Definition: • The concentration units for each chemical or radionuclide detected.	
Instructions: • Enter the concentration units for each chemical or radionuclide. Units may vary among matrices/media.	***Consult with the EPA risk assessor to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, µg/L for groundwater). Choices include:*** ***mg/l µg/l ng/l*** ***pg/l % ppm*** ***ppb ppt g/kg*** ***mg/kg µg/kg ng/kg*** ***µg/g mg/m³ µg/m³*** ***fibers/l fibers/m³ fibers/kg*** ***lbs/day µg/100cm² mg/cm²*** ***µRem/hr Rem/yr pCi/g*** ***pCi/kg pCi/m³ pCi/l*** ***pCi/m²/sec Other*** ***Not Documented***
Column 7 - Location of Maximum Concentration	
Definition: • The sample number that identifies the location where the highest concentration sample was taken.	
Instructions: • Enter the sample identifier which corresponds to the location where the sample was taken.	
Column 8 - Detection Frequency	
Definition: • The number of times the chemical or radionuclide was detected versus the number of times it was analyzed, expressed as the "fraction" X/Y.	***For example, 5/9 indicates that a chemical was detected in 5 out of 9 samples.***
Instructions: • Indicate the number of times the chemical or radionuclide was detected versus the number of times it was analyzed as the "fraction" X/Y.	***Consult the EPA risk assessor for an explanation of how Detection Frequency should be interpreted and applied.***
Column 9 - Range of Detection Limits	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Definition: • The lowest and highest detection limits.	***Consult the EPA risk assessor for definitions of detection limits.***
Instructions: • Enter the lowest and highest detection limit for the chemical or radionuclide in the medium separated by a dash (-). Consult with the EPA risk assessor if detection limits are not reported	
Column 10 - Concentration Used for Screening	
Definition: • The detected concentration which was used to compare to the screening value.	
Instructions: • Enter a concentration for each chemical being evaluated for the Medium. • Use a footnote to specify the source(s) of the Concentration Used for Screening.	***Consult the EPA risk assessor when determining this value. For example, maximum or average.***
Column 11 - Background Value	
Definition: • The background value for the chemical or radionuclide in that Medium as defined by guidance. ***If a "t-test" or other test which requires backup information is required, this supporting information is should be provided separately.***	
Instructions: • Enter the numerical value in the column. • Specify the source(s)/derivation of the Background Value in table footnotes. For example, literature value, data from a nearby site, statistical tool.	***Consult the EPA risk assessor for how background values are determined and whether and how background values are considered for COPC screening.***
Column 12 - Screening Toxicity Value (N/C)	
Definition: • The screening level used to compare detected concentrations of chemicals and radionuclides. Screening Toxicity Values are usually risk-based media concentrations (e.g., RBCs, SSLs, PRGs).	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Enter the Screening Toxicity Value. • Also indicate, with (N) or (C) whether the value is based on non-cancer or cancer effects, respectively. • To enter both the cancer and non-cancer screening toxicity values, either (1) record both in the same cell separated by a "/" (e.g., 15C/3.8N), or record one value in Column 12 and one in Column 13. • Use a footnote to provide a reference/explanation for the source of the screening values used.	***Consult the EPA risk assessor for the source of the screening value and for guidance on comparing the screening value to detected concentrations.***
Column 13 - Potential ARAR/TBC Value	
Definition: • Potential applicable or relevant and appropriate requirements (ARAR) and to be considered (TBC) values.	***For example, MCL values, soil cleanup level values, or other values to be considered.***
Instructions: • If multiple values exist, then enter the most conservative ARAR or TBC value.	***Consult the EPA risk assessor regarding the requirements for this column.***
Column 14 - Potential ARAR/TBC Source	
Definition: • The type or source of the ARAR/TBC value entered into the previous column.	***For example, MCL or SMCL.***
Instructions: • Enter the type or source of ARAR/TBC value which corresponds to the value in the previous column.	
Column 15 - COPC Flag (Y/N)	
Definition: • A code which identifies whether the chemical or radionuclide has been selected as a chemical of potential concern.	
Instructions: • Enter "Y" or "N" to indicate whether the chemical has been retained as a COPC.	***Y*** ***N***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Column 16 - Rationale for Selection or Deletion	
Definition: • The reason that the chemical or radionuclide was selected or not selected for quantitative or qualitative analysis.	***Consult the EPA risk assessor for the rationale codes.***
Instructions: • Enter the rationale codes for selection/deletion of chemicals of potential concern. Separate multiple codes with commas. • Define the codes for the "Rationale for Selection or Deletion" column in a footnote on this table.	***The example data table provides rationale codes for example purposes only.***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY

PURPOSE OF THE TABLE: • To provide the Exposure Point Concentrations (EPCs) for measured and modeled values • To provide statistical information on the derivation of the EPCs.	
INFORMATION DOCUMENTED: • Statistical information which was used to calculate the EPCs for chemicals and radionuclides detected in each Medium • Exposure Point Concentrations (RME and/or CT) • The statistics which were used to make the determinations as well as the rationale for the selection of the statistics for each chemical or radionuclide (i.e., discuss statistical derivation of measured data or approach for modeled data).	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Follow the instructions below to create separate sets of Table 3 for RME and CT when appropriate. • Complete one copy of Table 3 for each unique combination of the following three fields that will be quantitatively evaluated: Scenario Timeframe, Medium, and Exposure Medium. • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 3.1 and ending with 3.n, where "n" represents the total number of combinations of the three key fields. Add the extension .RME or .CT to the table number to indicate reasonable maximum exposure or central tendency. • Add the line "Reasonable Maximum Exposure" or "Central Tendency" to the table title.	***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation for each Exposure Pathway. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT
CONCENTRATION SUMMARY (continued)

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Attach supporting documentation regarding how the EPC was calculated. • Attach an example calculation so the methodology used to develop EPCs is clear to a reviewer. • Attach supporting information regarding how the concentration term was selected. • Consult the EPA risk assessor concerning use of decimals or scientific notation for data. • For certain media, all columns will not be completed.	***This information should be of sufficient detail that a reviewer can check and verify the calculations which were performed and obtain the same results as listed in this table.*** ***It is possible that the 95% UCL may not need to be calculated, for example, if only one data point is being considered.*** ***As another example, in some regions, the arithmetic average of concentrations measured from the center of the plume is used as the RME. In this case, the 95% UCL column does not need to be completed.***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes = the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY (continued)

BODY OF THE TABLE	
Column 1 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the table.	***Exposure Point should be defined the same way as was done in Planning Table 1.***
Column 2 - Chemical of Potential Concern	
Definition: • A chemical or radionuclide that is potentially site-related, with data of sufficient quality, that has been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals which were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers. Class descriptions (e.g., PAHs, VOCs, inorganics) can be included as a row before a group of chemicals.***
Column 3 - Units	
Definition: • The concentration units for each chemical and radionuclide detected.	

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT
CONCENTRATION SUMMARY (continued)

Instructions: • Enter units for each chemical and radionuclide. Units may vary among matrices/media.	***Consult with the EPA risk assessor to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, µg/L for groundwater). Choices include:*** ***mg/l µg/l ng/l*** ***pg/l % ppm*** ***ppb ppt g/kg*** ***mg/kg µg/kg ng/kg*** ***µg/g mg/m³ µg/m³*** ***fibers/l fibers/m³ fibers/kg*** ***lbs/day µg/100cm² mg/cm²*** ***µRem/hr Rem/yr pCi/g*** ***pCi/kg pCi/m³ pCi/l*** ***pCi/m²/sec Other*** ***Not Documented***
Column 4 - Arithmetic Mean	
Definition: • The arithmetic average of detected concentrations. This is the sum of the data divided by the number of data points.	
Instructions: • Enter the arithmetic average of detected concentrations.	***For duplicate samples, multiple rounds of sampling, and other data evaluation questions, consult the EPA risk assessor.***
Column 5 - 95% UCL (Distribution)	
Definition: • The statistic for the 95% Upper Confidence Limit on the arithmetic mean, and the type of distribution.	***Consult National guidance (Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive: 9285.7-08I, May 1992 or most recent updates) and the EPA risk assessor for calculating this term.***
Instructions: • Enter the 95% UCL for each COPC. • Indicate the distribution of the 95% UCL with (N) or (T) after the value as follows: N is Normal, T is Transformed (lognormal), NP is Nonparametric, O is Other. Define the codes describing the type of distribution in a footnote. • Specify any assumptions made in calculating the term in footnotes on this table. • Supporting information should be provided in the risk assessment.	***For example, for non-detects, ½ the sample quantitation limit is sometimes used as a proxy concentration. For duplicate sample results, the average value is sometimes used in the calculation.***

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Column 6 - Maximum Concentration (Qualifier)	
Definition: • Maximum Concentration - The highest detected concentration of the chemical or radionuclide in the Medium at the current Exposure Point which is above the sample quantitation limit. • Maximum Qualifier - The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the maximum concentration value.	
Instructions: • Enter the maximum concentration value. • Enter the qualifier associated with the maximum concentration.	***Provide the definitions of each qualifier in the table footnotes or in supporting information.***
Column 7 - Exposure Point Concentration Value	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that represents an estimate of the chemical or radionuclide concentration available from a particular Medium or route of exposure. This EPC value will be used to quantify potential cancer risks and non-cancer hazards. ***For example,*** ***the EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model groundwater concentrations, a downgradient exposure point, or if sediment concentrations are used to model fish tissue concentrations)***	***The EPC Value may be calculated, measured, or modeled.***
Instructions: • Enter the value in the column. • When using modeled data, enter the Exposure Point, COPC, EPC Value, and EPC Rationale, and include a reference to the location of backup information that show how the data were modeled in the risk assessment document.	***Consult the EPA risk assessor concerning how to determine this value.***
Column 8 - Exposure Point Concentration Units	

INSTRUCTIONS FOR TABLE 3

EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Definition: • The units of the data being used to calculate the EPC.	
Instructions: • Enter the units for the data being used to calculate the EPC.	***Consult the EPA risk assessor for preferences for different media (e.g., ug/L for groundwater; mg/kg for soil).***
Column 9 - Exposure Point Concentration Statistic	
Definition: • The statistic selected to represent the EPC Value based on the distribution of the data, number of data points, etc., and consultation with the EPA risk assessor.	***Often, this is 95% UCL of the log-transformed data.***
Instructions: • Enter the statistic used by choosing from the picklist to the right. • Define the codes used for the EPC Statistic column in table footnotes. If the statistic used is not on the picklist, enter an abbreviation in Column 9 and provide a description of the statistic in the footnotes of the table.	***Max (Maximum)*** ***95% UCL - N (95% UCL of Normal Data)*** ***95% UCL- T (95% UCL of Log-transformed Data)*** ***95% UCL - NP (Mean of Nonparametric Data)*** ***Mean - N (Mean of Normal Data)*** ***Mean - T (Mean of Log-transformed Data)*** ***Mean - NP (Mean of Nonparametric Data)***
Column 10 - Exposure Point Concentration Rationale	
Definition: • The reason the cited statistic was used to represent the EPC.	
Instructions: • Enter the rationale for the selection. Footnotes can be used.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS

PURPOSE OF THE TABLE: • To provide the exposure parameters used for intake calculations for each Exposure Pathway (Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, Receptor Age, and Exposure Route) • To provide the intake equations or models used for each Exposure Route/Pathway.	
INFORMATION DOCUMENTED: • Values used for each intake equation for each Exposure Pathway and the reference/rationale for each • Intake equation or model used to calculate the intake for each Exposure Pathway.	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Follow the instructions below to create separate sets of Table 4 for RME and CT where appropriate. • Complete one copy of Table 4 for each unique combination of the following three fields that will be quantitatively evaluated: Scenario Timeframe, Medium, and Exposure Medium. • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 4.1 and ending with 4.n, where "n" represents the total number of combinations of the three key fields. • Add the line "Reasonable Maximum Exposure" or "Central Tendency" to the table title. Add the extension .RME or .CT to the table number to the line indicate reasonable maximum exposure or central tendency.	***Information regarding intake calculations is specific to an Exposure Pathway. Thus, the Summary Box contains the first three identifiers used to specify an exposure pathway: Scenario Timeframe, Medium, and Exposure Medium.*** ***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation for each Exposure Pathway. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the Exposure Pathway.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Row 2 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes = the Exposure Medium.) Usually, the Medium is that targeted for possible remediation. .	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one Medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

BODY OF THE TABLE	
Column 1 - Exposure Route	
Definition: • The way a chemical or radionuclide comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Choose from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined (***i.e., Inhalation and Ingestion) ***Dermal*** ***Not Documented*** ***External (Radiation)***
Column 2 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (Receptor Population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Gatherer*** ***Other***
Column 3 - Receptor Age	
Definition: • The description of the exposed individual as defined by the EPA Region or dictated by the site.	***For example, a resident (Receptor Population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
Column 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout in Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the table. Multiple Exposure Points may be recorded in the same cell/row in this table if all other aspects of their Exposure Pathways (Scenario Timeframe, Medium, Exposure Medium, Exposure Route, Receptor Population and Receptor Age) are the same.	***Exposure Points should be defined the same way ad was done in Planning Table 1.***
Column 5 - Parameter Code	
Definition: • The code used for parameters (exposure factors) in the intake equation.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Instructions:

- Enter the appropriate code for the intake parameter from the picklist below.
- Develop additional intake parameter codes as necessary; be sure that additional codes are unique and defined in this table.

Parameter Code	*Parameter Definition*	*Units*
CS	*Chemical Concentration in Soil*	*mg/kg*
CW	*Chemical Concentration in Water*	*ug/l*
IR-W	*Ingestion Rate of Water*	*liters/day*
EF	*Exposure Frequency*	*days/year*
ED	*Exposure Duration*	*years*
CF1	*Conversion Factor 1*	*mg/ug*
BW	*Body Weight*	*kg*
AT-C	*Averaging Time (Cancer)*	*days*
AT-N	*Averaging Time (Non-Cancer)*	*days*
KP	*Permeability Constant (Dermal for Liquids)*	*cm/hr*
ET	*Exposure Time*	*hr/day*
CF2	*Conversion Factor 2*	*l/cm3*
SA	*Skin Surface Area Available for Contact*	*cm2*
IN	*Inhalation Rate*	*m^3/hr*
IR-SM	*Ingestion Rate (Swimming)*	*l/hr*
IR-S	*Ingestion Rate of Soil*	*mg/day*
DABS	*Dermal Absorption Factor (Solid)*	*--*
SSAF	*Soil to Skin Adherence Factor*	*mg/cm^2/event*
IR-F	*Ingestion Rate of Food*	*kg/meal*
EF-F	*Exposure Frequency (Food)*	*meals/year*

Do not provide detailed information regarding parameter modeled intakes in this table. This information should be provided separately. Column 10 of this table should list the name of the model or the equation used with a footnote referencing supporting information regarding modeled intake development.

Column 6 - Parameter Definition

Definition:

- The name of the exposure factor (e.g., ingestion rate, body weight) used in the intake equation corresponding to the parameter entered in Column 5..

Instructions:

- Enter the parameter definition, consistent with the picklist defined under the Parameter Code column.
- Develop additional intake parameter definitions as necessary.

Do not provide detailed parameter information regarding modeled intakes in this table. This information should be provided separately. (See instructions for Column 5).

Column 7 - Value

Definition:

- The numeric value of the parameter recorded in Column 6 used for the intake calculation.

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (continued)

Instructions: • Enter the values used for intake calculations. • For the CS and CW (chemical concentrations in soil and water, respectively) parameters, refer to Table 3.n or supporting documentation, as appropriate.	***Consult the EPA risk assessor for intake parameter values appropriate for each Exposure Pathway.***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Column 8 - Units	
Definition: • The units for the parameter code used in the intake equation.	
Instructions: • Enter the units for each parameter code consistent with the picklist defined under Column 5. • Develop additional intake parameter units as necessary.	***Consult with the EPA risk assessor to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, µg/L for groundwater). Choices include:*** ***mg/l µg/l ng/l*** ***pg/l % ppm*** ***ppb ppt g/kg*** ***mg/kg µg/kg ng/kg*** ***µg/g mg/m³ µg/m³*** ***fibers/l fibers/m³ fibers/kg*** ***lbs/day µg/100cm² mg/cm²*** ***µRem/hr Rem/yr pCi/g*** ***pCi/kg pCi/m³ pCi/l*** ***pCi/m²/sec Other*** ***Not Documented***
Column 9 - Rationale/Reference	
Definition: • The reason and reference for the parameter value used.	***This rationale may be based upon guidance or consultation with the EPA risk assessor.***
Instructions: • Enter the rationale and reference for the value. • If the value used is inconsistent with guidance values, provide a detailed explanation of the rationale and a complete reference for the value used.	***Provide sufficient detail that the reviewer can easily substantiate the value.***
Column 10 - Intake Equation/Model Name	
Definition: • The calculation, equation, or model used for intake estimates for each Exposure Route.	
Instructions: • Enter the intake calculation, equation, and/or model name. • Include a footnote providing a reference to the section of the risk assessment where information regarding modeled intake development is presented.	***For modeled intakes, the table should list the name of the model or the equation used.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL

PURPOSE OF THE TABLE: • To provide information on RfDs, target organs, and adjustment factors for chemicals • To provide oral to dermal adjustment factors • To verify references for non-cancer toxicity data.	
INFORMATION DOCUMENTED: • The RfDs for each of the COPCs, as well as modifying factors and oral to dermal adjustments • The organ effects of each of the COPCs • References for RfDs and organ effects.	***Surrogate toxicity values can also be entered in this table and indicated in the Source(s) column or with a footnote.***
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.1. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.1 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers. Class descriptions (e.g., PAHs, VOCs, inorganics) can be included as a row before a group of chemicals.***
Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the RfD for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Instructions: • Enter either "Chronic" or "Subchronic" in the field. Both values may be available for an individual COPC. • Subchronic values may not be available or necessary for an individual COPC. If that is the case, enter only "Chronic" in Column 2.	***Chronic*** ***Subchronic***
Column 3 - Oral RfD Value	
Definition: • The oral RfD value for each of the COPCs.	
Instructions: • Enter the value for the chronic and/or subchronic oral RfD (as appropriate).	
Column 4 - Oral RfD Units	
Definition: • The oral RfD units for each COPC.	
Instructions: • Enter units for each oral RfD value as necessary.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 5 - Oral Absorption Efficiency Value for Dermal	
Definition: • The adjustment factor used to convert oral RfD values to dermal RfD values. This value is an oral absorption factor.	
Instructions: • Enter the adjustment factor in this column. • Use a footnote to indicate the source of the Oral Absorption Efficiency for Dermal. Also, specify the section of the risk assessment text where the derivation of the Oral Absorption Efficiency for Dermal can be found.	
Column 6 - Absorbed RfD for Dermal Value	
Definition: • The adjusted RfD for each COPC detected that is derived from the oral RfD.	

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Instructions: • Enter the value that was derived from the adjustment factor in Column 5. • In a footnote on this table, reference the section of the risk assessment text where the derivation of the Absorbed RfDs for Dermal can be found.	***Derivations of the Absorbed RfD for Dermal should be performed in as directed by the EPA risk assessor.***
Column 7 - Absorbed RfD for Dermal Units	
Definition: • The units associated with the Absorbed RfD for Dermal value for each COPC.	
Instructions: • Enter units for each Absorbed RfD for Dermal value as necessary.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 8 - Primary Target Organ(s)	
Definition: • The organ(s) most affected (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Instructions: • Enter the name of the most affected organ or organ system in the column. If the critical effect (the one on which the RfD is based) involves multiple target organs, they should be shown, separated by a '/.' Target organs that are affected at higher doses should not be shown.	
Column 9 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS, HEAST, or other source for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Instructions: • Enter number obtained from IRIS, HEAST, or other source.	***Refer to IRIS, HEAST, or other source for these values.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 10 - RfD: Target Organ(s) Source(s)	
Definition: • The source of the RfD and target organ information.	
Instructions: • Enter the source of the RfD and target organ information. Use a colon to delineate multiple sources if the sources of information are different for RfD and target organ.	***IRIS*** ***HEAST*** ***NCEA*** ***OTHER***
Column 11 - RfD: Target Organ(s) Dates (MM/DD/YYYY)	
Definition: • The date of the source that was consulted for the RfD and target organ information in MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***

Instructions:
• Enter the date, in MM/DD/YYYY format, for both RfD and target organ information. Use a colon to delineate multiple dates if the dates of information are different for RfD and target organ.
  • ***For IRIS references, provide the date IRIS was searched.***
  • ***For HEAST references, provide the date of the HEAST reference.***
  • ***For NCEA references, provide the date of the information provided by NCEA.***
	For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION

PURPOSE OF THE TABLE: • To provide information on RfCs, RfDs, target organs, and adjustment factors for chemicals • To provide RfC to RfD adjustment factors • To verify references for non-cancer toxicity data.	
INFORMATION DOCUMENTED: • The RfDs for each of the COPCs, as well as modifying factors and RfC to RfD adjustments • The primary target organ effects of each of the COPCs • References for RfCs and organ effects.	***Surrogate toxicity values can also be entered in this table and indicated in the Source(s) column or with a footnote.***
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.2. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.2 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE:	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers. Class descriptions can be included as a row before a group of chemicals.***
Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the RfC or RfD for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	
Instructions: • Enter either “Chronic” or “Subchronic” in the field. Both values may be available for an individual chemical. • “Subchronic” values may not be available or necessary for an individual COPC. If that is the case, enter “Chronic” in Column 2.	***Chronic*** ***Subchronic***

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION (continued)

Column 3 - Inhalation RfC Value	
Definition: • The RfC value for each of the COPCs.	
Instructions: • Enter the value for the chronic and/or subchronic oral RfC (as appropriate).	
Column 4 - Inhalation RfC Units	
Definition: • The RfC units for each chemical detected.	
Instructions: • Enter units for each RfC as necessary.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 5 - Extrapolated RfD Value	
Definition: • The inhalation RfD for each COPC that is derived from the RfC value if an RfD is used to calculate risk instead of the RfC.	***The derivation of the RfD from an RfC should be performed as directed by the EPA risk assessor.***
Instructions: • Enter the derived RfD factor in this column. • In a footnote on this table, reference the section of the risk assessment text where the derivation of the adjusted RfDs can be found.	***The equation to derive the RfD from the RfC is to be included as a footnote in the table.***
Column 6 - Extrapolated RfD Units	
Definition: • The Extrapolated RfD units for each COPC.	
Instructions: • Enter units for each Extrapolated RfD value as necessary.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 7 - Primary Target Organ(s)	
Definition: • The organ that is most affected (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD/RfC is based.	

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION (continued)

Instructions: • Enter the name of the most affected organ or organ system in the column. • If the critical effect (the one on which the RfD/RfC is based) involves multiple target organs, they should all be shown, separated by '/.' Target organs affected at higher doses should not be shown.	
Column 8 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS, HEAST, or other source for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Instructions: • Enter number obtained from IRIS, HEAST, or other source.	***Refer to IRIS, HEAST, or other source for these values.***
Column 9 - RfC: Target Organ(s) Source(s)	
Definition: • The sources of the RfC and target organ information.	
Instructions: • Enter the sources of the RfC and target organ information. Use a colon to delineate between multiple information sources if the sources of information are different for RfC and target organ.	***IRIS*** ***HEAST*** ***NCEA*** ***OTHER***
Column 10 - RfC: Target Organ(s) Date(s) (MM/DD/YYYY)	
Definition: • The dates of the documents that were consulted for the RfC and target organ information in MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***

Instructions: • Enter the dates, in MM/DD/YYYY format, for RfC and target organ information. Use a colon to delineate between multiple dates if the dates of information are different for RfC and target organ. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the information provided by NCEA.***	***For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.***

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS

PURPOSE OF THE TABLE: • To provide information on toxicity values, target organs, and adjustment factors for unusual chemicals or circumstances or surrogate chemicals that are not covered by Tables 5.1 or 5.2. Table 5.3 is not required if there are not such chemicals or circumstances. • To verify references for non-cancer toxicity data.	***For example, a toxicity factor derived specifically for an individual risk assessment should be documented in Table 5.3.***
INFORMATION DOCUMENTED: • The toxicity values for each of the COPCs, as well as modifying factors • The organ effects of each of the COPCs • References for toxicity values and organ effects.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.3. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.3 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***Refer to RAGS, the risk assessment technical approach, and the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers. Class descriptions (e.g., PAHs, VOCs, inorganics) can be included as a row before a group of chemicals.***
Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the toxicity value for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA -SPECIAL CASE CHEMICALS (continued)

Instructions: • Enter either "Chronic" or "Subchronic" in the field. Both values may be available for an individual COPC. • "Subchronic" values may not be available or necessary for an individual chemical. If that is the case, enter only "Chronic" in the column.	***Chronic*** ***Subchronic***
Column 3 - Parameter Name	
Definition: • The name of parameter/toxicity factor being recorded for each COPC.	***Toxicity factors derived specifically for an individual risk assessment should be recorded here.***
Instructions: • Enter the name of parameter/toxicity factor.	
Column 4 - Parameter Value	
Definition: • The toxicity parameter value for each COPC.	
Instructions: • Enter the value for the chronic and/or subchronic toxicity values (as appropriate).	
Column 5 - Parameter Units	
Definition: • The units associated with the toxicity value for each COPC.	
Instructions: • Enter units for each reference as necessary.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 6 - Primary Target Organ(s)	
Definition: • The organ(s) most affected (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Instructions: • Enter the name of the most affected organ or organ system in the column. If the critical effect (the one that the RfD is based on) involves multiple target organs, they should all be shown, separated by a '/.' Target organs affected at higher doses should not be shown.	

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA -SPECIAL CASE CHEMICALS (continued)

Column 7 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS, HEAST, or other source for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Instructions: • Enter number obtained from IRIS, HEAST, or other source.	***Refer to IRIS, HEAST, or other source for these values.***
Column 8 - Parameter: Target Organ(s) Sources	
Definition: • The sources of the toxicity and target organ information.	
Instructions: • Enter the sources of the toxicity and target organ information. Use a colon to delineate multiple sources if the sources of information for toxicity and target organ are different.	***IRIS*** ***HEAST*** ***NCEA*** ***OTHER***
Column 9 - Parameter: Target Organ(s) Date(s) (MM/DD/YYYY)	
Definition: • The dates of the sources that were consulted for the toxicity information and the target organ information in MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***
Instructions: • Enter the dates, in MM/DD/YYYY format, for the toxicity and target organ information. Use a colon to delineate between multiple dates if the sources of information are different for toxicity and target organ. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the information provided by NCEA.***	***For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.***

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL

PURPOSE OF THE TABLE: • To provide the oral and dermal cancer toxicity information (values and sources of information) for chemicals of potential concern • To provide the methodology and adjustment factors used to convert oral cancer toxicity values to dermal toxicity values • To provide weight of evidence/cancer guideline descriptions for each chemical of potential concern.	
INFORMATION DOCUMENTED: • Oral and dermal toxicity values for chemicals of potential concern • Weight of evidence/cancer guidelines descriptions for chemicals of potential concern • The source/reference for each toxicity value.	***Surrogate toxicity values can also be entered in this table and indicated in the 'Source(s)' column or with a footnote.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.1 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses. Class descriptions can be included as a row before a group of chemicals.***
Column 2 - Oral Cancer Slope Factor Value	
Definition: • Cancer slope factor for ingestion.	
Instructions: • Enter the oral cancer slope factor value for each of the COPCs.	***Refer to IRIS and HEAST. If toxicity information is not available, contact EPA's National Center for Environmental Assessment (NCEA) office.***

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 3 - Oral Cancer Slope Factor Units	
Definition: • Units for the cancer slope factor for ingestion.	
Instructions: • Enter units for each oral cancer slope factor.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 4 - Oral Absorption Efficiency for Dermal	
Definition: • The absorbed factor used to convert the oral RfD values to dermal RfD values.	
Instructions: • Enter the oral to dermal adjustment factor. • Use a footnote to indicate the source of the Oral Absorption Efficiency for dermal.	.
Column 5 - Absorbed Cancer Slope Factor for Dermal Value	
Definition: • The absorbed dermal cancer slope factor for each chemical of potential concern which typically is derived from the oral cancer slope factor.	***Derivation of the dermal cancer slope factor should be performed in consultation with the EPA risk assessor.***
Instructions: • Enter the derived dermal cancer slope factor. • Use a footnote to specify the section of the risk assessment text where the derivation of the Absorbed Cancer Slope Factor for Dermal can be found.	
Column 6 - Absorbed Cancer Slope Factor for Dermal Units	
Definition: • The units associated with each Absorbed Cancer Slope Factor for Dermal.	
Instructions: • Enter the units for the Absorbed Cancer Slope Factors for Dermal.	***Typically $(mg/kg\text{-}day)^{-1}$. Consult with the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 7 - Weight of Evidence/Cancer Guideline Description	

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Definition: • An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen.	
Instructions: • Provide the weight of evidence or cancer guideline description. • Choose from the categories to the right.	***Weight of Evidence:*** ***A - Human carcinogen*** ***B1 - Probable human carcinogen - indicates that limited human data are available.*** ***B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.*** ***C - Possible human carcinogen*** ***D - Not classifiable as a human carcinogen*** ***E - Evidence of noncarcinogenicity*** ***Cancer Guideline Description:*** ***Known/Likely*** ***Cannot be Determined*** ***Not Likely***
Column 8 - Oral CSF Source(s)	
Definition: • A reference for the oral cancer slope factor.	
Instructions: • Enter the reference for the toxicity information.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA***
Column 9 -Oral CSF Date(s) (MM/DD/YYYY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***

Instructions:
• Enter the date in MM/DD/YYYY format.
  • ***For IRIS references, provide the date IRIS was searched.***
  • ***For HEAST references, provide the date of the HEAST reference.***
  • ***For NCEA references, provide the date of the information provided by NCEA.***
	For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION

PURPOSE OF THE TABLE: • To provide the inhalation cancer toxicity information (values and sources of information) for chemicals of potential concern • To provide the methodology and adjustment factors used to convert inhalation unit risks to inhalation cancer slope factors • To provide weight of evidence/cancer guideline descriptions for each chemical of potential concern.	
INFORMATION DOCUMENTED: • Inhalation toxicity values for chemicals of potential concern • Weight of evidence/cancer guidelines descriptions for chemicals of potential concern • The source/reference for each toxicity value.	***Surrogate toxicity values can also be entered in this table and indicated in the 'Source(s)' column or with a footnote.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.2 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses. Class descriptions (e.g., PAHs, VOCs, inorganics) can be included as a row before a group of chemicals.***
Column 2 - Unit Risk Value	
Definition: • Toxicity values for carcinogenic effects expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. Cancer slope factors can be calculated from unit risk values.	
Instructions: • Enter the inhalation unit risk value	***Refer to IRIS and HEAST; if toxicity information is not available, contact EPA's National Center for Environmental Assessment (NCEA) office.***

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Column 3 - Unit Risk Units	
Definition: • The units used for the unit risk for each chemical detected.	
Instructions: • Enter the units for the unit risk values.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 4 - Inhalation Cancer Slope Factor Value	
Definition: • A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime.	***Usually the cancer slope factor is the upper 95th % confidence limit of the dose-response curve for inhalation.***
Instructions: • Enter the Inhalation Cancer Slope Factor if Cancer Slope Factors were used to calculate risk instead of Inhalation Unit Risks.	
Column 5 - Inhalation Cancer Slope Factor Units	
Definition: • The units used for the Inhalation Cancer Slope Factor for each chemical detected.	
Instructions: • Enter the units for the Inhalation Cancer Slope Factors.	***Consult EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 6 - Weight of Evidence/Cancer Guideline Description	
Definition: • An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen.	

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Instructions: • Provide the weight of evidence or cancer guideline description. • Choose from the categories to the right.	***Weight of Evidence:*** ***A - Human carcinogen*** ***B1 - Probable human carcinogen - indicates that limited human data are available.*** ***B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.*** ***C - Possible human carcinogen*** ***D - Not classifiable as a human carcinogen*** ***E - Evidence of noncarcinogenicity*** ***Cancer Guideline Description:*** ***Known/Likely*** ***Cannot be Determined*** ***Not Likely***

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Column 7 - Unit Risk: Inhalation Cancer Slope Factor Source(s)	
Definition: • A reference for the Unit Risk and Inhalation Cancer Slope Factor values.	
Instructions: • Enter the reference(s) for Unit Risk and Inhalation Cancer Slope Factor values. Use a colon to delineate multiple sources.	***IRIS*** ***HEAST*** ***NCEA***
Column 8 - Unit Risk: Inhalation Cancer Slope Factor Date(s) (MM/DD/YYYY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***
Instructions: • Enter the date in MM/DD/YYYY format. Use a colon to delineate between multiple dates, if multiple sources of information were used. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the information provided by NCEA.***	***For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.***

INSTRUCTIONS FOR TABLE 6.3

CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS

PURPOSE OF THE TABLE: • To provide cancer toxicity information for unusual chemicals, surrogate chemicals or circumstances that are not covered by Tables 6.1 or 6.2. Table 6.3 (or non-standard tables) can also be used to accommodate threshold carcinogens, if applicable. Table 6.3 is not required if there are no such chemicals or circumstances.	***For example, a toxicity factor derived specifically for an individual risk assessment should be documented in Table 6.3.***
INFORMATION DOCUMENTED: • Cancer toxicity information (values and units) for special case chemicals • The date and source of the toxicity information.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it 6.3. • The table should contain a row for each COPC considered.	
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.3 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and consult the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses. Class descriptions can be included as a row before a group of chemicals.***
Column 2 - Parameter Name	
Definition: • The name of the toxicity parameter being recorded.	
Instructions: • Enter the names of the toxicity parameter being recorded.	

INSTRUCTIONS FOR TABLE 6.3

CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS (continued)

Column 3 - Parameter Value	
Definition: • The toxicity value for each listed parameter for each chemical of potential concern.	
Instructions: • Enter the toxicity value for each chemical of potential concern.	***Refer to IRIS, HEAST, or other source for these valued.***
Column 4 - Parameter Units	
Definition: • The units associated with the toxicity value.	
Instructions: • Enter the toxicity units.	***Typically (mg/kg-day)$^{-1}$*** ***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 5 -Source(s)	
Definition: • A reference for the cancer toxicity information.	
Instructions: • Enter the reference for toxicity information. Use a colon to delineate multiple sources.	***IRIS*** ***HEAST*** ***NCEA*** *OTHER*
Column 6 - Date(s) (MM/DD/YYYY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in the MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***
Instructions: • Enter the date in MM/DD/YYYY format. Use a comma to delineate between multiple dates, if multiple sources of information were used. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the information provided by NCEA.***	***For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.***

INSTRUCTIONS FOR TABLE 6.4

CANCER TOXICITY DATA - EXTERNAL (RADIATION)

PURPOSE OF THE TABLE: • To provide cancer toxicity information for radionuclides.	
INFORMATION DOCUMENTED: • Cancer toxicity information (values and units) for radionuclides. • The source and date of the toxicity information.	
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.4 does not replace toxicological profiles for the individual radionuclides that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and the EPA risk assessor to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Radionuclides that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the radionuclides that were selected as COPCs from Table 2.	***Radionuclides may be grouped in the order that the risk assessor chooses.***
Column 2 - Cancer Slope Factor Value	
Definition: • A Cancer Slope Factor is an age-averaged lifetime excess cancer incidence rate per unit intake (or unit exposure for external exposure pathways) and is used to convert the intake to a cancer risk. Ingestion and inhalation slope factors are central estimates in a linear model of the age-averaged, lifetime attributable radiation cancer incidence (fatal and nonfatal cancer) risk per unity of activity inhaled or ingested, expressed as risk/picocurie (pCi). External exposure slope factors are central estimates of the lifetime attributable radiation cancer incidence risk for each year of exposure to external radiation from photon-emitting radionuclides distributed uniformly in a thick layer of soil, and are expressed as risk/yr per pCi/gram of soil.	
Instructions: • Enter the value of the cancer slope factor for each COPC.	
Column 3 - Cancer Slope Factor Units	
Definition: • The units associated with the Cancer Slope Factor value.	

INSTRUCTIONS FOR TABLE 6.4

CANCER TOXICITY DATA - EXTERNAL (RADIATION) (continued)

Instructions: • Enter the units for the Cancer Slope Factor value.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 4 -Source(s)	
Definition: • A reference for the cancer slope or conversion factor value.	
Instructions: • Enter the reference(s) for the cancer slope or conversion factor value. Use a colon to delineate multiple sources.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA*** ***OTHER***
Column 5 - Date(s) (MM/DD/YYYY)	
Definition: • The date of the document that was consulted for the cancer slope or conversion factor value in the MM/DD/YYYY format.	***The MM/DD/YYYY format refers to month/day/year.***
Instructions: • Enter the date in MM/DD/YYYY format. Use a colon to delineate between multiple dates, if multiple sources of information were used. ***For IRIS references, provide the date IRIS was searched.*** ***For HEAST references, provide the date of the HEAST reference.*** ***For NCEA references, provide the date of the information provided by NCEA.***	***For example, the MM/DD/YYYY version of the date March 30, 1995 is 03/30/1995.***

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

PURPOSE OF THE TABLE: • To provide a summary of the variables used to calculate chemical cancer risks and non-cancer hazards • To show the EPC and intake used in the non-cancer hazard and cancer risk calculations • To present the result of the calculation for each Exposure Route/Pathway for each COPC • To provide the total hazard index and cancer risk for all Exposure Routes/Pathways for the Scenario Timeframe and Receptor presented in this table.	
INFORMATION DOCUMENTED: • The non-cancer hazard quotient and unit risk for each COPC for each Exposure Route/Pathway • The values used for EPC, cancer and non-cancer intakes, reference doses, and reference concentrations.	***An alternate presentation is also available with cancer information shown on Table 7a and non-cancer information shown on Table 7b.***
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 7 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age). • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. ***Note: Each combination of the three key fields and the first four columns should be found as a row in Table 1.*** • Number each table uniquely, beginning with 7.1 and ending with 7.n where "n" represents the total number of combinations of the six key fields. • Different tables should be prepared to address RME and CT non-cancer hazard calculations when appropriate. • Tables 7.1.RME through 7.n.RME should be completed for RME non-cancer and cancer hazard calculations when appropriate. • Tables 7.1.CT through 7.n.CT should be completed for CT non-cancer and cancer hazard calculations.	***It is possible that some tables may contain some of the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation for each Exposure Pathway. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA rise assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS (continued): • An optional approach is to report cancer and non-cancer values on separate tables as follows: - Number non-cancer tables 7.1A.RME - 7.nA.RME or 7.1A.CT - 7.nA.CT, where "n" represents the total number of combinations of the three key fields. - Number cancer tables 7.1B.RME-7.nB RME or 7.1B.CT-7.nB.CT, where "n" represents the total number of combinations of the three key fields. - The first seven columns remain the same for both non-cancer or cancer tables. Columns 8-12 contain either the Cancer Risk Calculations data or the Non-Cancer Hazard Calculations data. - See the blank Planning Tables for an illustration of how Table 7 data can be separated as described above.	***When reporting cancer and non-cancer values on separate tables, use the column names to identify instructions for completing each column, as the column number will differ after Column 7.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE:	
• All table entries, with the exception of Intake, Non-Cancer Hazard and Cancer Risk are presented on tables preceding Table 7. • With the exception of modeled intakes, the intake value is the result of calculations performed using parameters and equations presented in Table 4 and concentrations presented in Table 3. • The Total Non-Cancer Hazard is to be summed for each Exposure Route and Exposure Point in the Exposure Route Total and Exposure Point Total rows. The total Non-Cancer Hazard for all Exposure Pathways for a given Receptor is to be presented as the Total of Receptor Hazards Across All Media at the bottom of the table. This value represents the non-cancer hazard of the various exposure routes/pathways combined. • The total Cancer Risk is to be summed for each Exposure Route and Exposure Point in the Exposure Route Total and Exposure Point Total rows. The Total Cancer Risk for all Exposure Pathways for a given Receptor is to be presented as the Total of Receptor Risks Across All Media at the end of the table. This value represents the cancer risk of the various Exposure Routes/Pathways combined to a given receptor.	

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the Exposure Pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (Receptor Population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Gatherer*** ***Other***
Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the EPA Region or dictated by the site.	***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes equal the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Column 2 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table.	***Exposure Point should be defined in the same way as was done in Planning Table 1.***
Column 4 - Exposure Route	
Definition: • The way a chemical or radionuclide comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Instructions: • Enter the Exposure Route considered from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined*** (i.e., Inhalation and Ingestion) ***Dermal*** ***Not Documented*** ***External (Radiation)***

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Column 5 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the COPCs selected from the COPC screening.	***Table 2 documents COPC screening.***
Column 6 - EPC Value	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that represents an estimate of the chemical or radionuclide concentration. ***The EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model groundwater concentration at a downgradient exposure point, or if sediment concentrations are used to model fish tissue concentrations).***	***The EPC Value may be calculated, measured, or modeled.***
Instructions: • Enter the EPC value for each COPC. This value should be in Table 3. • If an EPC other than the one found in Table 3 is used, indicate it with a footnote and include a reference to supporting information that will show how the data were modeled in the risk assessment.	***Table 3 documents EPC calculations for RME and CT.***
Column 7 - EPC Units	
Definition: • The units associated with the EPC value.	
Instructions: • Enter the units for EPC values.	***Consult the EPA risk assessor for unit preferences.***
Column 8 - Cancer Risk Calculations - Intake/Exposure Concentration Value (Also Column 8 on Table 7a)	

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Definition: • Intake is a measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time (e.g. mg chemical/kg body weight/day).	***Refers to the intake/exposure concentration results using the parameters and equations, calculations and/or models presented in Table 4.***
Instructions: • Enter the result of the intake calculations/modeling or the exposure concentration performed for each COPC and Exposure Route.	***The intake equations, calculations, and/or models are documented in Table 4.***
Column 9 - Cancer Risk Calculations - Intake/Exposure Concentration Units (Also Column 9 on Table 7a)	
Definition: • The units for intake or exposure concentration for each COPC and Exposure Route.	
Instructions: • Enter the units from the intake calculation or exposure concentration for each COPC which corresponds to each Exposure Route.	
Column 10 - Cancer Risk Calculations - CSF/Unit Risk Value (Also Column 10 on Table 7a)	
Definition: • The slope factor is used to estimate an upper-bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of potential carcinogen. • Unit Risk is a toxicity value for carcinogenic effects expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. These measures can be calculated from cancer slope factors.	
Instructions: • Enter the cancer slope factor or unit risk for each COPC which corresponds to each exposure route.	***The slope factors and unit risk values for each COPC are presented in Tables 6.1, 6.2, and 6.3.***
Column 11 - Cancer Risk Calculations - CSF/Unit Risk Units (Also Column 11 on Table 7a)	
Definition: • The units for the cancer slope factor or unit risk.	
Instructions: • Enter the cancer slope factor or unit risk units for each COPC for each Exposure Route.	
Column 12 - Cancer Risk Calculations - Cancer Risk (Also Column 12 on Table 7a)	

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Definition: • The result of the cancer risk calculation for each COPC for each Exposure Route and Exposure Pathway.	
Instructions: • Enter the cancer risk calculation for each COPC. • Sum the cancer risk results for each Exposure Route in the Exposure Route Total row. • Sum the cancer risk calculation results for each Exposure Point in the Exposure Route Total row. • Sum the total cancer risk results for all Exposure Pathways in the Total of Receptor Risks Across all Media row.	***The sum of all Exposure Routes represents the total cancer risk for all Exposure Routes/ Pathways.***
Column 13 - Non-Cancer Hazard Calculations - Intake/Exposure Concentration Value (Also Column 8 on Table 7b)	
Definition: • Intake is a measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time.	***Refers to the intake/exposure concentration results using the parameters and equations/calculations and/or models presented in Table 4.***
Instructions: • Enter the result of the intake calculations/modeling performed for each COPC and Exposure Route.	***The intake equations, calculations, and/or models are documented in Table 4.***
Column 14 - Non-Cancer Hazard Calculations - Intake/Exposure Concentration Units (Also Column 9 on Table 7b)	
Definition: • The units for intake for each COPC and Exposure Route.	
Instructions: • Enter the units from the intake calculation for each COPC which corresponds to each Exposure Route.	
Column 15 - Non-Cancer Hazard Calculations - RfD/RfC Value (Also Column 10 on Table 7b)	
Definition: • RfD is the toxicity value for evaluating non-cancer effects resulting from exposures. • RfC is the toxicity value for inhalation.	

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Instructions: • Enter the RfD or RfC value. • For RfD, enter the reference dose for each COPC which corresponds to each exposure route. • Enter Oral RfD values for ingestion. • Enter Adjusted Dermal RfD values for dermal. • Enter Adjusted Inhalation RfD/RfC values for inhalation.	***The reference doses (RfD/RfC) for each COPC are presented in Table 5.***

INSTRUCTIONS FOR TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (continued)

Column 16 - Non-Cancer Hazard Calculations - RfD/RfC Units (Also Column 11 on Table 7b)	
Definition: • The units associated with the reference dose or reference concentration.	***RfDs are typically reported in mg/kg-day, a dose term, RfCs in mg/m^3.***
Instructions: • Enter the units for reference dose or reference concentration for each COPC for each exposure route. • RfC is typically reported as a concentration in air (mg/m^3) which can be converted to an inhaled dose (mg/kg-day).	
Column 17 - Non-Cancer Hazard Calculations - Hazard Quotient (Also Column 12 on Table 7b)	
Definition: • The ratio of a single substance exposure level, over a specified time period, to a reference dose for that substance, derived from a similar exposure period.	
Instructions: • Enter the result of the hazard quotient calculation for each COPC. • Sum the hazard quotient for each Exposure Route in the Exposure Route Total row. • Sum the hazard quotient for each Exposure Point in the Exposure Route Total row. • Sum the hazard quotients for all Exposure Pathways in the Total of Receptor Hazards across all Media row.	***The Hazard Index represents the total non-cancer hazard for all exposure routes/pathways presented in this table.***

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS

PURPOSE OF THE TABLE: • To provide a summary of the variables and approaches used to calculate radiation cancer risks • To show the EPC used in the radiation cancer risk calculations • To document the radiation risk calculation approach used to calculate radiation cancer risks • To show, based on the documented risk calculation approach, the intake and cancer slope factors • To present the result of the calculation for each Exposure Route/Pathway for each COPC • To provide the total radiation cancer risks for each Exposure Route/Pathway for the Scenario Timeframe, and Receptor presented in this table • To provide the total radiation cancer risks for each Exposure Point for the Scenario Timeframe and Receptor in this table • To provide the total radiation cancer risks across all media for the Scenario Timeframe and Receptor in this table	***Radiation can be evaluated two ways: 1) Calculate cancer risks. The evaluation method used needs to be documented in the Planning Tables 2) Compare radiation doses to standards (i.e., EPA NESHAPS or MCLs or DOE/NRC cleanup standards).*** ***Table 8 is used to show the variables and results when using the first method. The Dose Assessment Worksheet can be used to calculate doses which can be compared to radiological dose standards.***
INFORMATION DOCUMENTED: • The approach for calculating the radiation cancer risk for each COPC for each Exposure Route/Pathway • The values used for EPC, intake and cancer slope factor for each COPC for each Exposure Route • The cancer risk value for each COPC for each Exposure Route/Pathway • Total cancer risk values by Exposure Route, Exposure Point, and across all media for the Scenario Timeframe and Receptor presented in this table	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 8 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age). • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 8.1 and ending with 8.n where "n" represents the total number of combinations of the three key fields. • Table 8.1.RME through 8.n.RME should be completed for RME cancer risk calculations.	***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • All table entries, with the exception of risk calculation approach, intake, and cancer risk are presented on tables preceding Table 8. • With the exception of modeled intakes, the intake value is the result of calculations performed using parameters and equations presented in Table 4 and concentrations presented in Table 3. • The total cancer risk for each Exposure Route is to be summed and indicated in the Exposure Route Total row. This value represents the cancer risk of the various Exposure Routes across each Exposure Pathway designated in the table. • The total cancer risk for Each Exposure Point is to be summed and presented in the row labeled Exposure Point Total. • The total cancer risk for all media is to be summed and presented in the box labeled "Total of Receptor Risks Across All Media". This value represents the total radiation cancer risk to the receptor for the timeframe designated in the table.	
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Gatherer*** ***Other***
Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the EPA Region or dictated by the site.	***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Infant*** ***Toddler*** ***Pregnant*** ***Other***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes equal the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Column 2 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one Medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical or radionuclide within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table.	***Exposure Point should be defined in the same way as was done in Planning Table 1.***
Column 4 - Exposure Route	
Definition: • The way a chemical or radionuclide comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Enter the Exposure Route considered from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined (i.e., Inhalation and Ingestion)*** ***Dermal*** ***Not Documented*** ***External (Radiation)***
Column 5 - Radionuclide of Potential Concern	
Definition: • Radionuclides that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the radionuclides of potential concern selected from the COPC screening.	***Table 2 documents COPC screening.***
Column 6 - EPC Value	

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that represents an estimate of the chemical or radionuclide concentration available from a particular Medium or route of exposure.	***The EPC value may be developed from a statistical derivation of measured data or from modeled data. Typically, the EPC units are expressed as activity per mass such as pCi/gram.***
Instructions: • Enter the EPC value for each COPC. • If an EPC other than from Table 3 is used, indicate it with a footnote that includes a reference to supporting information that will show how the data were modeled in the risk assessment.	***Table 3 documents EPC calculations.***
Column 7 - EPC Units	
Definition: • The units associated with the EPC value.	
Instructions: • Enter the units for the EPC values.	***The units may vary depending on the medium.***
Column 8 - Risk Calculation Approach	
Definition: • The approach used for calculating radiation cancer risks.	***Consult the EPA risk assessor or National guidance for the appropriate risk calculation approach. US EPA RAGS Part A and RESRAD are examples of risk calculation approaches.***
Instructions: • Enter the radiation risk calculation approach used for each COPC.	
Column 9 - Cancer Risk Calculations - Intake/Activity Value	
Definition: • Intake is a measure of exposure expressed in units of activity such as pCi.	***Refers to the intake using the parameters and equations/calculations, and/or models presented in Table 4.***
Instructions: • Enter the result of the intake calculations/modeling performed.	***The intake calculations and/or models are documented in Table 4.***
Column 10 - Cancer Risk Calculations - Intake/Activity Units	
Definition: • The units for intake/activity for each COPC and Exposure Route.	

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Instructions: • Enter the units for the intake/activity for each COPC which corresponds to each Exposure Route.	

INSTRUCTIONS FOR TABLE 8

CALCULATION OF RADIATION CANCER RISKS (continued)

Column 11 - Cancer Risk Calculations - CSF Value	
Definitions: • A cancer slope factor (CSF) is an age-averaged lifetime excess cancer incidence rate per unit intake (or unit exposure for external exposure pathways). Ingestion and inhalation slope factors are central estimates in a linear model of the age-averaged, lifetime attributable radiation cancer incidence (fatal and nonfatal cancer) risk per unity of activity inhaled or ingested, expressed as risk/picocurie (pCi). External exposure slope factors are central estimates of the lifetime attributable radiation cancer incidence risk for each year of exposure to external radiation from photon-emitting radio nuclides distributed uniformly in a thick layer of soil, and are expressed as risk/yr per pCi/gram of soil.	***Slope factors presented in Table 6.4 for each radionuclide are the same as those presented here.***
Instructions: • Enter the CSF for each COPC which corresponds to each Exposure Route.	***The cancer slope factors for each COPC are presented in Table 6.4.***
Column 12 - Cancer Risk Calculations - CSF Units	
Definition: • The units associated with the cancer slope factor value.	
Instructions: • Enter the cancer slope factor units for each COPC for each Exposure Route.	***Consult the EPA risk assessor to determine if there is a preference regarding the units to be used.***
Column 13 - Cancer Risk Calculations - Cancer Risk	
Definition: • The result of the cancer risk calculation for each COPC for each exposure route and pathway. Cancer risk is the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to a potential carcinogen.	
Instructions: • Enter the cancer risk calculation for each COPC. • Sum the cancer risk results for each Exposure Route in the Exposure Route Total row. • Sum the cancer risk results for each Exposure Point in the Exposure Point Total row. • Sum the total radiation cancer risk results for all media in the bottom right-hand corner box labeled "Total of Receptor Risks Across All Media".	***The sum of all Exposure Routes represents the total cancer risk for an Exposure Pathway.*** ***The sum of all Exposure Pathways represent the total cancer risk for a medium.*** ***The sum of all media represents the "Total of Receptor Risks Across All Media".***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

PURPOSE OF THE TABLE: • To provide a summary of cancer risks and non-cancer hazards for each Receptor by Medium, Exposure Medium, Exposure Route, and Exposure Point	***Table 9 presents cancer risk and non-cancer hazard information for all COPCs and media/exposure points quantitatively evaluated.***
INFORMATION DOCUMENTED: • The cancer risk and non-cancer hazard to each Receptor for each COPC by Exposure Route and Exposure Point • The total cancer risk and non-cancer hazard for each Exposure Point, Exposure Medium, and Medium • The total cancer risks and non-cancer hazards for a Receptor across all media • The primary target organs for non-carcinogenic hazard effects.	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 9 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age). • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely beginning with 9.1 and ending with 9.n where "n" represents the total number of combinations of the three key fields. • Different tables should be prepared to address RME and CT Risk and Hazard summaries. • Tables 9.1. RME through 9.n. RME should be completed for RME Risk and Hazard summaries. • Table 9.1.CT through 9.n.CT should be completed for CT Risk and Hazard Summaries.	***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same data.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE:	
• Cancer risk and non-cancer hazard information for all COPCs and media/Exposure Points quantitatively evaluated is to be presented in Table 9. • All table entries are presented on Tables preceding Table 9. • Documentation of the non-cancer hazard and carcinogenic risk values for chemicals was presented on Table 7. • Documentation of the carcinogenic risk values for radionuclides was presented on Table 8. • Total cancer risks and non-cancer hazards associated with each Receptor are to be presented for each Exposure Point, Exposure Medium, and Medium and across all media and all Exposure Routes.	

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Gatherer*** ***Farmer*** ***Gardener*** ***Other***
Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the Region or dictated by the site.	***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes equal the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	
Instructions: • Choose from the picklist to the right. For each Medium, • The last entry in this column should be "Medium Total." In this row, the total risk/HI from each Medium (for all chemicals, Exposure Routes, Exposure Points, and Exposure Media) for the current Receptor is entered in the Exposure Routes Total Column.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Column 2 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Instructions: • Choose from the picklist to the right. • For each Exposure Medium, the last entry in this column should be "Exposure Medium Total." This refers to the total risk/HI from each Exposure Medium (for all chemicals, Exposure Routes and Exposure Points) for the current Receptor. These totals are recorded in the Carcinogenic and Non-Carcinogenic Exposure Routes Total Columns.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table. • For each Exposure Point, the last entry in this column should be "Exposure Point Total." This refers to the total risk/HI (for all chemicals and Exposure Routes) for the current Receptor. These totals are recorded in the Carcinogenic and Non-Carcinogenic Exposure Routes Total columns.	***Exposure Point should be defined in the same way as was done in Planning Table 1.***
Column 4 - Chemical of Potential Concern	
Definition: • The COPCs quantitatively considered in the risk characterization.	
Instructions: • Enter the COPCs from previous tables. • Enter the term "Chemical Total" at the end of the list of chemicals for each Exposure Point. Use this row to record total risk/HI values from all chemicals at each Exposure Point. • Enter the term "Radionuclide Total" at the end of the list of radionuclides for each Exposure Point. Use this row to record total risk/HI values from all radionucides for each Exposure Point.	
Columns 5, 6, 7, and 8 - Carcinogenic Risk - Ingestion, Inhalation, Dermal and External (Radiation)	
Definition: • The cancer risk value calculated by Receptor for each COPC for each Exposure Route for each Exposure Point.	***The value at the bottom of each column presents the total cancer risk by Exposure Route for each Exposure Point.***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Instructions: • Enter the cancer risk value calculated by Receptor for each Exposure Route for each Exposure Point. • Enter the cancer risk totals for each Exposure Route in the rows labeled "Chemical Total" and "Radionuclide Total."	
Column 9 - Carcinogenic Risk - Exposure Routes Total	
Definition: • The total cancer risk for each COPC across all Exposure Routes at each Exposure Point.	
Instructions: • Enter the sum of the cancer risks across Exposure Routes for each COPC. • Enter the sum of the cancer risks in this column for each Exposure Point in the "Exposure Point Total" row. • Enter the total cancer risk for each Exposure Medium and individual Medium in the "Exposure Medium Total"and "Medium Total" rows. • For each Receptor, enter the total cancer risks across all Media and all Exposure Routes as "Receptor Risk Total."	***Consult the EPA risk assessor to determine the appropriate summing of risks.***
Column 10 - Non-Carcinogenic Hazard Quotient - Primary Target Organ	
Definition: • The primary effect reported as a primary target organ effect in IRIS, HEAST, or other source.	
Instructions: • Enter the primary target organ effect as reported in IRIS, HEAST, or other source.	***Consult the EPA risk assessor to determine if multiple effects should be provided.***
Columns 11, 12, and 13 - Non-Carcinogenic Hazard Quotient - Ingestion, Inhalation, Dermal	
Definition: • The non-cancer hazard calculated by Receptor for each COPC for each Exposure Route for each Exposure Point.	***The value at the bottom of each column presents the non-cancer hazard by exposure route for each exposure point, for all effects considered together.***
Instructions: • Enter the non-cancer hazard value calculated by Receptor for each COPC for each Exposure Route for each Exposure Point. • Enter the non-cancer hazard totals for each Exposure Route in the rows labeled "Chemical Total" and "Radionuclide Total."	***Consult the EPA risk assessor for summing hazard quotients.***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Column 14 - Non-Carcinogenic Hazard Quotient - Exposure Routes Total	
Definition: • The total non-cancer hazard calculated for each COPC across all Exposure Routes at each Exposure Point.	***The Totals in each column present the total non-cancer hazards by Exposure Routes for each Exposure Point. The values beneath the table under this column present hazard quotients for target organs.***
Instructions: • Enter the sum of non-cancer hazards across the three Exposure Routes in each Exposure Route column. • Enter the sum of the non-cancer hazards across Exposure Routes for each COPC and primary target organ. • Enter the sum of the non-cancer hazards in this column for each Exposure Point in the "Exposure Point Total" row. • Enter the total hazard index for each Exposure Medium and Medium in the "Exposure Medium Total" and "Medium Total" rows. • Enter the total hazard index across all media and all Exposure Routes as "Receptor HI Total." • Enter the total hazard index for primary target organs. • Sum the hazard quotient target organ effects by target organ and enter into the appropriate boxes.	***Consult the EPA risk assessor for specific instructions in summing hazard quotients.***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY

PURPOSE OF THE TABLE: • To provide a summary for each Receptor by Medium, Exposure Route, and Exposure Point of cancer risks and non-cancer hazards that trigger the need for remedial action. • The Risk Assessor may consult the Remedial Project Manager and other members of the project team to determine what levels of risk may be actionable at the site and what should be included in Table 10. The risks shown on Table 10 should be based upon the Remedial Project Manager's recommendation. If all risks are below actionable levels, determine with the Remedial Project Manager which chemicals should be shown to document the suitability of a No Action decision.	***Table 10 presents cancer risk and non-cancer hazard information for those COPCs and media/exposure points that the Remedial Project Manager determines trigger the need for remedial action (the risk drivers).***
INFORMATION DOCUMENTED: • The cancer risk and non-cancer hazard to each Receptor for each chemical by Exposure Route and Exposure Point for risk drivers • The cancer risk and non-cancer hazard for each Exposure Point, Exposure Medium, and Medium across all Exposure Routes for risk drivers • The total cancer risks and non-cancer hazards for a Receptor across all media for risk drivers • The primary target organs for non-carcinogenic hazard effects for risk drivers.	***For the purpose of these instructions, those COPCs determined to trigger the need for cleanup are simply referred to as "Chemicals."***
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 10 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age). • Enter each combination of these three fields in the Summary Box in the upper left corner of the table. • Number each table uniquely beginning with 10.1 and ending with 10.n where "n" represents the total number of combinations of the three key fields. • Different tables should be prepared to address RME and CT Risk and Hazard summaries. • Tables 10.1. RME through 10.n. RME should be completed for RME Risk and Hazard summaries. • Table 10.1 CT through 10.n.CT should be completed for CT Risk and Hazard Summaries.	***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***Separate tables may be necessary to ensure transparency in data presentation. Replication of information is readily accomplished using spreadsheet software.*** ***Consult the EPA risk assessor for alternatives (e.g., footnotes) to preparing multiple tables with the same information.***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE	
• Cancer risk and non-cancer hazard information for only those COPCs and media/exposure points that trigger the need for remedial action (the risk drivers) is to be presented in Table 10. • All table entries are presented on Tables preceding Table 10. • Documentation of the non-cancer hazard and cancer risk values for chemicals was presented on Table 7. • Documentation of the carcinogenic risk values for radionuclides was presented on Table 8. • Total cancer risks and non-cancer hazards associated with each Receptor are to be presented for each Exposure Point, Exposure Medium, Medium across all media and all Exposure Routes.	
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the Exposure Pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Receptor Population	
Definition: • The exposed individual relative to the Exposure Pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gatherer*** ***Gardener*** ***Other***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the Region or dictated by the site.	***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The substance (e.g., air, water, soil) that is a potential source of contaminants in the Exposure Medium. (The Medium will sometimes equal the Exposure Medium.) Usually, the Medium is that targeted for possible remediation.	***Enter only the Media that have risks or hazards exceeding target levels.***
Instructions: • Choose from the picklist to the right. • For each Medium, the last entry in this column should be "Medium Total." This refers to the total risk/HI for each Medium (for all chemicals, Exposure Routes, Exposure Points, and Exposure Media) for the current Receptor. These totals are recorded in th Carcinogenic and Non-Carcinogenic Exposure Routes Total columns.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Column 2 - Exposure Medium	

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Definition: • The contaminated environmental medium to which an individual may be exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and are available for exposure to receptors.***	***Enter only the Exposure Media that have risks or hazards exceeding target levels.***
Instructions: • Choose from the picklist to the right. • For each Exposure Medium, the last entry in this coluymn should be "Exposure Medium Total." This refers to the total risk/HI from each Exposure Medium (for all chemicals, Exposure Routes, and Exposure Points) for the current Receptor. These totals are recorded in the Carcinogenic and Non-Carcinogenic Exposure Routes Total columns.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge, Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Vapors*** ***Plant Tissue*** ***Animal Tissue*** ***Fish Tissue*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Spring Water***
Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an Exposure Medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Fish Tissue (the Exposure Medium) and Trout in Dean's Creek (the Exposure Point) is evaluated.***	***Enter only the Exposure Points that have risks or hazards exceeding target levels.***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Instructions: • Provide the information as text in the Table. • For each Exposure Point, the last entry in this column should be "Exposure Point Total." This refers to the total risk/HI from each Exposure Point (for all chemicals, Exposure Routes, and Exposure Points) for the current Receptor. These totals are recorded in the Carcinogenic and Non-Carcinogenic Exposure Routes Total Columns.	***Exposure Point should be defined in the same way as was done in the Planning Table 1.***
Column 4 - Chemical	
Definition: • The COPCs quantitatively considered in the risk characterization.	***Enter only the chemicals that have risks exceeding target levels.***
Instructions: • Enter the COPCs from previous tables that exceed target levels. • Enter the term "Chemical Total" at the end of the list of chemicals for each Exposure Point. • Enter the term "Radionuclide Total" at the end of the list of radionuclides.	
Columns 5, 6, 7 and 8 - Carcinogenic Risk - Ingestion, Inhalation, Dermal, and External (Radiation)	
Definition: • The cancer risk value calculated by Receptor for each chemical for each Exposure Route for each Exposure Point.	***Enter only the risks that exceed target levels.*** ***The value at the bottom of each column presents the cancer risk from all chemicals by Exposure Route for each Exposure Point.***
Instructions: • Enter the cancer risk value calculated by Receptor for each chemical for each Exposure Route for each Exposure Point that exceeds target levels. • Enter the cancer risk totals for each Exposure Route in the last row.	
Column 9 - Carcinogenic Risk - Exposure Routes Total	
Definition: • The total cancer risk for each chemical across all Exposure Routes at each Exposure Point.	

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Instructions: • Enter the sum of the cancer risks across Exposure Routes for each chemical. • Enter the sum of the cancer risks in this column for each Exposure Point in the "Exposure Point Total" row. • Enter the total cancer risk for each Exposure Medium and Medium in the "Exposure Medium Total" and "Medium Total" rows. • Enter the total cancer risk across all Media and all Exposure Routes as "Receptor Risk Total".	
Column 10 - Non-Carcinogenic Hazard Quotient - Primary Target Organ	
Definition: • The primary effect reported as a primary target organ effect in IRIS, HEAST, or other source.	
Instructions: • Enter the primary target organ effect as reported in IRIS, HEAST, or other source. This target organ should also appear in Table 5.	***Consult the EPA risk assessor to determine if multiple effects should be provided.***

INSTRUCTIONS FOR TABLE 10

RISK SUMMARY (continued)

Columns 11, 12, and 13 - Non-Carcinogenic Hazard Quotient - Ingestion, Inhalation, Dermal	
Definition: • The non-cancer hazard calculated by Receptor for each Chemical for each Exposure Route for each Exposure Point.	***Enter only the hazards that exceed target levels.*** ***The value at the bottom of each column presents the non-cancer hazard by Exposure Route for each Exposure Point, for all effects considered together.***
Instructions: • Enter the non-cancer hazard value calculated by Receptor for each chemical for each Exposure Route for each Exposure Point that exceeds target levels. • Enter the non-cancer hazard totals for each Exposure Route in the last row, corresponding to the term "Chemical Total" in Column 9.	***Consult the EPA risk assessor for summing hazard quotients.***
Column 14 - Non-Carcinogenic Hazard Quotient - Exposure Routes Total	
Definition: • The total non-cancer hazard calculated for each chemical across all Exposure Routes at each Exposure Point.	***The totals in each column present the total non-cancer hazards across all Exposure Routes for each Exposure Point.*** ***The values at the bottom of this column present hazard quotients for target organs.***
Instructions: • Enter the sum of non-cancer hazards across the three Exposure Routes in Columns 11, 12, and 13. • Enter the sum of the non-cancer hazards across Exposure Routes for each chemical and primary target organ. • Enter the sum of the non-cancer hazards in this column for each Exposure Point, Exposure Medium, and Medium in the “Exposure Point Total,” “Exposure Medium Total,” and “Medium Total” rows, respectively. • Enter the total hazard index across all Media and all Exposure Routes as “Receptor HI Total.” • Enter the total hazard index for primary target organs. • Sum the hazard quotient target organ effects across all media by target organ and enter into the appropriate boxes below the table.	***Consult the EPA risk assessor for specific instructions in summing hazard quotients.***